

Deep crustal framework of the north-central margin of Angola

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The acquisition and interpretation of new seismic data over the distal parts of continental margins have allowed a better image and comprehension of the transition between continental and oceanic crusts. As a result, the classical rifting and continental breakup models have been revised and improved to create a model coherent with the existing data. In this paper, the interpretation of ultra-deep 2D seismic sections, acquired by ION-GXT and integrated with gravimetric modelling, allows the identification of the crustal limits in the central-north region of the Angola margin in the Kwanza and Lower Congo basins. Four crustal domains were defined: (1) proximal (formed by extended continental crust); (2) necking domain (where there is a rapid thinning of the continental crust); (3) distal (formed by hyper-extended continental crust and exhumed mantle); and (4) oceanic (formed by the oceanic crust). Integration of interpreted seismic data with gravity modelling and analysis of regional geological maps of the area leads to the definition of two regions with distinctive characteristics. The first area, to the north, underlies the Lower Congo Basin and is represented by an extensive distal crustal domain, presenting few basement highs affecting the thick pre-salt section. This area is related to basement rocks belonging to the West Congo Belt and reworked cratonic margins. The second area occurs to the south beneath the Kwanza Basin, and is represented by a narrower distal crustal domain displaying several basement highs affecting the thinner presalt section. The southern area is related to basement rocks belonging to the Angola Craton and to the Central Shield.